Claims

We claim:

1. A foundry binder system, which will cure in the presence of sulfur dioxide and an oxidizing agent, comprising:

    (a) 45 to 80 parts by weight of an epoxy resin;

    (b) 5 to 40 parts of an ester of a fatty acid;

    (c) 0.05 to 3 parts of a fluorinated acid;

    (d) an effective amount of an oxidizing agent; and

    (e) 0 parts of an ethylenically unsaturated monomer or polymer.

    wherein (a), (b), (c), and (d) are separate components or mixed with another of said components, and where said parts by weight are based upon 100 parts of binder.

2. The binder system of claim 2 wherein the wherein the epoxy resin is selected from the group consisting of epoxy resins derived from bisphenol A, epoxy resins derived from bisphenol F, epoxidized novolac resins, cycloalphatic epoxy resins, and mixtures thereof.

3. The binder system of claim 2 wherein the epoxy resin has an epoxide equivalent weight of about 165 to about 225 grams per equivalent.

4. The foundry binder system of claim 3 wherein the fluorinated acid is

hydrofluoric acid.

5. The binder system of claim 4 wherein the oxidizing agent is cumene hydroperoxide.

6. The foundry binder system of claim 5 wherein the amount of epoxy resin is from 50 to 70 parts by weight, the amount of ester of a fatty acid is from 15 to 30, the amount of fluorinated acid is from 0.1 to 1.0, and the amount of amount of a oxidizing agent is from 12 to 30 parts by weight, where the weights are based upon 100 parts of the binder system.

7. The foundry binder system of claim 6 which further comprises a polyol.

8. A foundry mix comprising:

(a) a major amount of foundry aggregate;

(b) an effective bonding amount of the foundry binder system of claim 1, 2, 3, 4, 5, 6, or 7.

9. A cold-box process for preparing a foundry shape comprising:

(a) introducing the foundry mix of claim 8 into a pattern; and

(b) curing with gaseous sulfur dioxide.

10. A foundry shape prepared in accordance with claim 9.

11. A process of casting a metal article comprising:

(a) fabricating a foundry shape in accordance with claim 10;

(b) pouring said metal while in the liquid state into said ~~coated~~ foundry shape;

(c) allowing said metal to cool and solidify; and

(d) then separating the molded article.

12. A casting prepared in accordance with claim 11.